STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7032

Joint Petition of Vermont Electric Power Company, Inc. ("VELCO"), Green Mountain Power Corporation ("GMP") and the Town of Stowe Electric Department ("Stowe") for a Certificate of Public Good pursuant to 30 V.S.A. § 248 authorizing VELCO to upgrade a substation in Moretown, Vermont; construct .3 miles of side by side, single pole tap; construct a switching station in Duxbury, Vermont; construct 9.4 miles of 115 kV transmission line; upgrade an existing GMP 34.5 kV subtransmission line; construct a substation in Stowe, Vermont; and for Stowe to construct 1.05 miles of 34.5 kV subtransmission line in Stowe, Vermont.

SURREBUTTAL TESTIMONY OF
DAVID RAPHAEL
ON BEHALF OF THE
VERMONT DEPARTMENT OF PUBLIC SERVICE

June 27, 2005

Summary: The purpose of Mr. Raphael's testimony is to respond to the rebuttal testimony of the Petitioners and other parties on the topic of aesthetics.

Surrebuttal Testimony
of
David Raphael

Q. Are you the same David Raphael who previously filed testimony in this docket?

A. Yes, I am.

Q. Have you reviewed the rebuttal testimony and rebuttal questions filed by the representatives of the Gregg Hill residents, Mr. Orr and Mr. Abraham, and do you have any additional responses or conclusions to offer?

A. Yes I have, and they are based on the original plans they submitted as well as a site visit conducted with VELCO and ANR officials on June 20, 2005, and traveling along Gregg Hill Road several times since the submission of my direct testimony.

Q. What are your conclusions?

A. I agree with ANR witnesses Ms. Bulmer and Ms. Frederick. I agree that the reroute as conceptually proposed would benefit only a few individuals and property owners at the expense of potentially impacting many more individuals who visit and use the State Forest and Park, which experience as many as 60,000 visits per year (Rebuttal testimony of Susan Bulmer, p. 15). Specifically, with regard to the proposed reroute through the Mt. Mansfield State Forest, I do not believe this route to be as viable as the original route as proposed by VELCO, and that there are a number of impediments that work against this option, regardless of the variations proposed by VELCO. They include:

a. All the reasons cited by Ms. Bulmer and Ms. Frederick with regard to the management plan and the potential violation of the Uses of State Lands Policies #s 1, 2 and 3, the integrity of the forest itself and the potential of the aesthetic impact to state forest and state park users that this alternative route poses;

b. My belief that the VELCO-proposed route can be satisfactorily mitigated within the provisions of the Quechee analysis to avoid an undue adverse impact and as recommended in Exhibit DPS-DR-1;

c. The overall principle of remaining within existing corridors wherever feasible

rather than creating new corridors through undeveloped natural areas as would be the case here - and with the consequent potential visual impacts to the Waterbury Reservoir and Gregg Hill Road caused by a new clearcut corridor and the addition of poles; and

d. Because we do not have a specific corridor agreed upon or delineated, it is difficult to come to any final or absolute conclusions about whether this alternate really makes sense on the ground. I was able to review in the field a route marked by VELCO, but that route was indeterminate in some locations.

With these conclusions in mind, I therefore must respectfully disagree with Mr. Orr that the proposed reroute will have less impact than the existing proposal for upgrading the existing corridor.

Q. Did your site visit yield any additional conclusions?

A. Yes, several. Please see my accompanying exhibit which provides a photographic representation of the possible corridor routes of approximately 1400-1500 ft. (.3 mi) through the State Forest. The overall conclusions was that the terrain is very difficult in places, which may require extensive clearing and impact from the construction alone; and that the landscape, aesthetic and natural resource values would be irreparably degraded by the construction of a new corridor in this location.

I also believe that careful pole placement, with aggressive and extraordinary efforts made to ensure the retention of the existing buffering and accommodating vegetation in the vicinity of the Magdamo-Abraham, Orr and Bankson residences, as well as additional new plantings, will help to satisfactorily mitigate the aesthetic impact of the upgraded line with its poles and conductors. There will still be an adverse impact here, and I understand the concerns of the Gregg Hill residents and concur with some of the concerns raised by Mr. Orr - the proposed upgrade will definitely have a more of an impact on aesthetics than the current 34.5 kV line does - but I believe an undue adverse impact can be avoided with carefully developed and considered mitigation measures. I also should add and emphasize that the final detailed mitigation measures should be developed with the direct involvement

of the affected residents and property owners.

My site visit along Gregg Hill Road also yielded the conclusion that in the months when leaves are on the trees- typically the time when most people are outside - walking, jogging, biking, as well as driving to view scenery - the existing vegetation effectively shields the bulk of the line and the proposed upgrade from public view and the view of many of the residences along Gregg Hill Road. Having said that, from an aesthetics perspective I have no reason to object to the reroutes individuals have offered for their own properties, including the reroutes through the Murray property and especially the Bieler property. These have the potential for removing the line from view in that particularly scenic area, where there is open space and views to the Worcester Range. These options have not been as yet taken up by VELCO and at such time when they do become part of the possible mitigation options then I would hope to have an opportunity to review them at that time. Thus I did not conduct a site visit of these sections of the proposed reroute the residents have offered because I did not have permission to go on private property and because I believed that the first step of the reroute was the most critical piece of the proposal as it involved public lands.

Q. Have you reviewed the testimony filed by Mr. Ted Teffner and do you have any response to that testimony?

A. I have reviewed the testimony and I do have some responses. Specifically, in the Black Bear Run area, our intent is to remove the visual impact of the line from the direct view of residents as best as possible. This will need to be done with detailed design to balance scale, location, height and conductor array. I am open to considering the conductor array which poses the least visual impact for aesthetics.

Q. Mr. Teffner states that your mitigation measures are not detailed enough and also provides a recommendation for limiting the removal of danger trees. Do you agree with his recommendation?

A. First of all it is difficult to provide detailed vegetative management recommendations without specific, mapped or drawn information about existing trees, their heights, condition and caliper. I have been pressing VELCO to retain as much vegetation as possible. I have also been trying to find definitive information on what can and cannot be removed - so far I have only come across policies rather than specific guidelines. Having said this, I agree with Mr. Teffner's recommendations with regard to danger trees if the technical concerns can be satisfactorily addressed, as I recognize the need to address reliability. I also concur with the recommendation to implement plantings to screen and buffer and would support a further level of detail in this regard with the input of affected landowners and residents. However, it needs to be pointed out that my charge in this project has not been to provide the detailed design of mitigation measures; that is VELCO's responsibility.

Q. Do you have any comments with regard to Mr. Teffner's recommendations for (1) the Marshall Road/Nichols Field area and (2) the Shaw Hill/River Road area?

A. (1) I do not agree that VELCO should employ H-frame structures in the Marshall Road/Nichols Field area. They would create more of a presence and visual intrusion with the increased number of poles and the overall form that the H-frame creates in the landscape - it is just more visible. I do believe the single poles should be as low as possible, and their placement can be accomplished without the poles being visible above the background vegetation when viewed from Route 100 in particular. I believe the existing landscape can better accommodate and de-emphasize the single pole than the H-frame. The H-frame, again, creates more of a visual presence in the landscape.

(2) In the Shaw Hill/River Road area, I do support Mr. Teffner's recommendation to relocate the right of way to the furthest east feasible, if it can be done, and to have VELCO work with landowners to develop appropriate mitigation measures for aesthetic impacts in this area.

Q. Have you reviewed the Prefiled Rebuttal Testimony of VELCO's witnesses in this docket? Do you have any comments or responses to this testimony?

A. Yes, I have reviewed the testimony and I will respond, as appropriate, to the individual testimony, starting with Ms. Moulton.

Q. What conclusions do you have with regard to Ms. Moulton's prefiled rebuttal testimony?

A. Ms. Moulton states that I have overstated the aesthetic impacts to the Waterbury Reservoir with the proposed upgrade "as set forth in the rebuttal testimony of Boyle and Portz". Messrs.'s Boyle and Portz, however, aside from extensive critique of our simulation and detailed description of their methodology, provide no substantive reasons for their opinion and provide misleading statements such as: "DPS-DR 7 clearly demonstrates that the reservoir crossing is not visible from Waterbury State Park". We beg to differ, and state unequivocally that this exhibit, exhibit DPS-DR-8 and Boyle/Portz's own simulations and photos (TJB/AP-1/2) clearly show that the reservoir crossing <u>is</u> visible from Waterbury State Park.

Q. Do you have any responses to Mr. Johnson's testimony?

A. Yes, I want to respond to Mr. Johnson's statement that "Mr. Raphael does not seem to recognize that lower pole heights reduce VELCO's flexibility in right of way clearing" (p. 22). I want to state that I do understand this concept, but that I have to weigh the height of the pole and its relative visibility from certain vantage points versus the desire to retain trees along the right of way. In some instances it is more critical to keep the tower heights lower to reduce long distance visibility as opposed to higher towers and more trees retained adjacent to the right of way.

I do not question VELCO's right or responsibility to manage their vegetation in a manner that they believe to be the most prudent. I am suggesting that we need to explore further the parameters of vegetation retention where screening and buffering is critical. I believe this to be a very important issue given the presence of VELCO corridors in neighborhoods and in aesthetically sensitive areas.

Q. Do you have any response to the Boyle/Portz prefiled rebuttal testimony?

A. Yes I do and I will address my responses to statements in the order in which they appear in the testimony, beginning with their disagreement with the alternative route we proposed for Blush Hill. First of all, the photos referred to on pages 63 and 65 show existing conditions and do not show the proposed new towers. Secondly, Boyle/Portz admit their proposal will result in sky lining or sky lighting poles above the background elements. This is a very sensitive area from a visual perspective. It is also important to note that the Town of Waterbury is concerned with visual impacts and aesthetic intrusions undermining their scenic landscapes; to that end they are developing a hillside and ridgeline ordinance to protect this resource. The view from this roadside may be one of the most spectacular views in the town; therefore I believe extraordinary measures are necessary to protect this view. As our Exhibit DPS-DR-6 shows, the proposed reroute alternative we are presenting will remove the pole from the primary view and also allow sufficient backgrounding to better "absorb" and de-emphasize the presence of the towers and lines.

Q. What is your response to Boyle/Portz's arguments with regard to the proposal for undergrounding the line across the Waterbury Reservoir?

A. I must disagree with their testimony on several points. First of all they make quite a bit of the asserted inaccuracy of our simulation, and seem to indicate that because the simulation is inaccurate, therefore our arguments with regard to the potential for an undue adverse impact are misleading and invalid. Despite some misleading statements of their own, one of which I cited in my response to question 8 above, and another which I will cite next, these exhibits alone, and certainly the simulations, are not the primary basis for my conclusion that the LCP in this location will result in an undue adverse impact on aesthetics. Boyle/Portz state on line 13 of page 15 that "the conductors of the 34.5 kV and the 115 kV will span the Waterbury reservoir in parallel sag". Yet their own simulation shows this (approximately) only because the towers appear to be the same height which conflicts with other exhibits and representations that VELCO has provided in their original submission. Even with the perspective view the towers would have to be viewed at different heights. Do note that the Boyle/Portz simulation does not show any balls on the

lines as exist presently - we were told directly by VELCO that the balls would probably remain, as float planes and small aircraft, as well as sailboats do operate in the vicinity of the Reservoir. Apparently, the proposed towers will be high enough to not require the balls, but this needs to be confirmed.

We recognize that we may have erred with our simulation of the view from the Waterbury State Park. There are a number of ways to produce simulations, some crude and some quite sophisticated. We have used a variety of techniques and do not necessarily question Boyle/Portz's approach. As we did not have at the time or use all the possible information, our simulation from the State Park may not be accurate. Having said this, no simulation can be absolutely exact with the type of information we all typically use. To this point, for example, there seems to be a dramatic discrepancy between GIS based elevation data that Arcview or other computer software relies on to help construct such simulations and VELCO's exhibit RCJ 24, page 9/20. The topography shown in this section differs 20 to 40 feet from that of the elevation models used in the Boyle/Portz simulation. This would be very likely to affect visibility from any selected point of towers above treelines. Additionally, the Boyle/Portz simulation (or any others for that matter) cannot account for the required tree clearing and the effect that would result from the necessary vegetation removals for the expanded right of way – and that detailed information has not even been generated. When we looked at their modeling in the community we also found a discrepancy between where the poles would be located on the Gregg Hill side of the Reservoir and where they say the poles will be in their Exhibit TJB/AP 2a. Thus I think it is dangerous to rely solely on simulations to ascertain exactly what can or cannot be seen from any one point, and I have never stated that simulations provide an exact representation of what one will see. Proponents of a project can select the best vantage point from which to construct a simulation. Likewise, opponents can select the worst. Simulations are most valuable for 1) getting a sense of scale and visual impact and 2) seeing the benefits of removing an element from the landscape - thus comparing existing conditions at the Waterbury Reservoir with what it would look like if the current line was undergrounded along with the proposed new 115kV circuit. It was dramatic to see this when we created a similar simulation for the PV20 line crossing Lake Champlain at the Route 2/Sandbar State

Park area.

Suffice to say then that simulations, regardless of how detailed and technically sophisticated, are still an assumption of what something will look like from a single viewing point. As such they provide only a limited perspective to begin with. They also can be only as accurate as the base information provided. Viewing the potential impact of a transmission corridor proposal in an aesthetically sensitive context requires an understanding of many different factors, many different vantage points, time of year, time of day, whether you are in a car, in a boat, stationary, etc.

Boyle/Portz also criticizes DPS-DR-10 for cropping, but do not refute the view of what is seen, and do not refute the fact that a 101 foot tower will exceed the heights of the surrounding trees, estimated at 60 feet. The towers will be visible above the treeline in some locations, to be sure- this is logical given that the trees are 50 to 75 feet in this area and the towers proposed are 70, 79 and 101.5 feet tall. But the impact is not just from the towers alone. I believe it is actually more of a visual intrusion to see all the wires across the water in what is otherwise an exceptional scenic resource.

Simulations are helpful in understanding how a project might look, but no simulation is totally accurate and in our approach simulations are one of many tools which help us understand the possible impacts of a project. For the most accurate representations, line of sight sections are the best means for determining whether a project can or cannot be seen from a particular vantage point; this point is stressed in the original and most comprehensive publication on simulations, Stephen Sheppard's *Visual Simulation.* Flying a balloon or erecting a mock-up or some other means by which to see the placement and height of the proposed new towers would be very useful as well to determine overall visibility.

The primary basis for my conclusions come from an understanding of the importance of the Reservoir, the Park and the State Forest to the 60,000 annual visits by local residents, statewide recreators and visitors, and from experiencing the park and its environs "in the flesh". I think we would be hard pressed to consider this as a "limited number of viewers" as Boyle/Portz state on page 12 of their testimony.

Q. Do you have anything else to add with regard to the Waterbury Reservoir?

A. Ms. Bulmer, the Parks Regional Manager, also supports my conclusions with regard to aesthetics, as indicated in her prefiled rebuttal testimony on pp. 2 and 3. I stand by my conclusions presented in my initial testimony.

Q. Boyle/Portz disagree with your recommendations for miles 7.7 to 8.2. Do you have a response to this?

A. Please see my Answer 6. I believe one single pole, double circuit, if kept to the minimum profile possible, albeit higher, is preferable to the clutter and impact of two poles of different heights and/or an H-frame structure with a single pole adjacent to it. I would add that I do support their recommendation and commitment to work with the affected property owners and constituencies to supplement the vegetation present in the area.

Q. Both Bernard Machia (because of cost) and Boyle/Portz disagree with your recommendation to separate the Stowe substation and to plant along the north side of the site. Do you have a response?

A. It is possible that the north side plantings might be unnecessary today, but I believe that for the long term it will be desirable to provide plantings here to screen the substation should development occur or trees be removed to the north. It may not be critical at this time, however.

As far as separating the substation goes, if it can be demonstrated that equally effective screening can be accomplished with more effective berming and planting of larger trees, then that approach may be acceptable and adequate to avoid an undue adverse determination.

Q. Have you provided any additional exhibits with your surrebuttal testimony?

A. Yes I have. We have prepared a revision to the viewshed analysis at Waterbury Reservoir to correct for visibility using the tower heights to determine where the conductors would be at their approximate elevation above the water level, and to simplify the graphics for clarity by removing the no-wake zone overlay. We have also provided a non-cropped version of our original simulation from the Blush Hill access. We have also

prepared some notes and photos from our recent site visit to the proposed Gregg Hill alternate route through the Mt. Mansfield State Forest.

List of Exhibits included with this testimony:

DPS-DR-18 Area of Potential Visibility from the Proposed 115kV Line (Revised from DPS-DR-7)

DPS-DR-19-21 Resubmission of Waterbury Reservoir Crossing (View from Blush Hill Boat Access) Depicting the simulation uncropped (DPS-DR-9-11)

DPS-DR-22 Waterbury Reservoir Crossing (View from Blush Hill Boat Access) Summer time photos

DPS-DR-23 Reroute Alternative Proposed by Gregg Hill Residents

Q. Does this conclude your surrebuttal testimony?

A. Yes it does.